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Forest Statistics Series:

West Virginia No. 8

Forest Statistics for the Northern Section of West Virginia

Northeastern Forest Experiment Station

Upper Darby, Pennsylvania
Ralph W. Marquis, Director

1953

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United States Department of Agriculture • • • Forest Service

FOREWORD

This is the eighth and last in a new series of reports about forest areas and timber volume in the State of West Virginia. It is a product of the forest survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the Nation-wide forest survey being made by the Forest Service, U. S. Department of Agriculture.

This report supersedes the preliminary statistical report that was issued for the Monongahela Section of West Virginia in 1949. The volumes in that preliminary report were computed from standard volume tables. Local volume tables, constructed when the survey was completed for the entire State, showed that the average tree in West Virginia has more taper than was provided for in the volume tables originally used. This meant, of course, that the preliminary volume estimates were too high.

In addition, a recently completed study of log quality in the State showed that some of the material that was originally included in the saw-timber volume is unsuitable for standard lumber, tie, or timber logs. The total sawlog volume has been reduced further to correct for this.

The West Virginia Conservation Commission provided the aerial photographs used in this survey, and assigned a number of Commission employees to assist in carrying out the field work.

Field work in this section of West Virginia was supervised by Harry W. Camp, Jr. C. Allen Bickford developed the statistical procedures used in the survey. Computations were made under the supervision of Roland H. Ferguson.

Ralph W. Marquis

Ralph W. Marquis
Director

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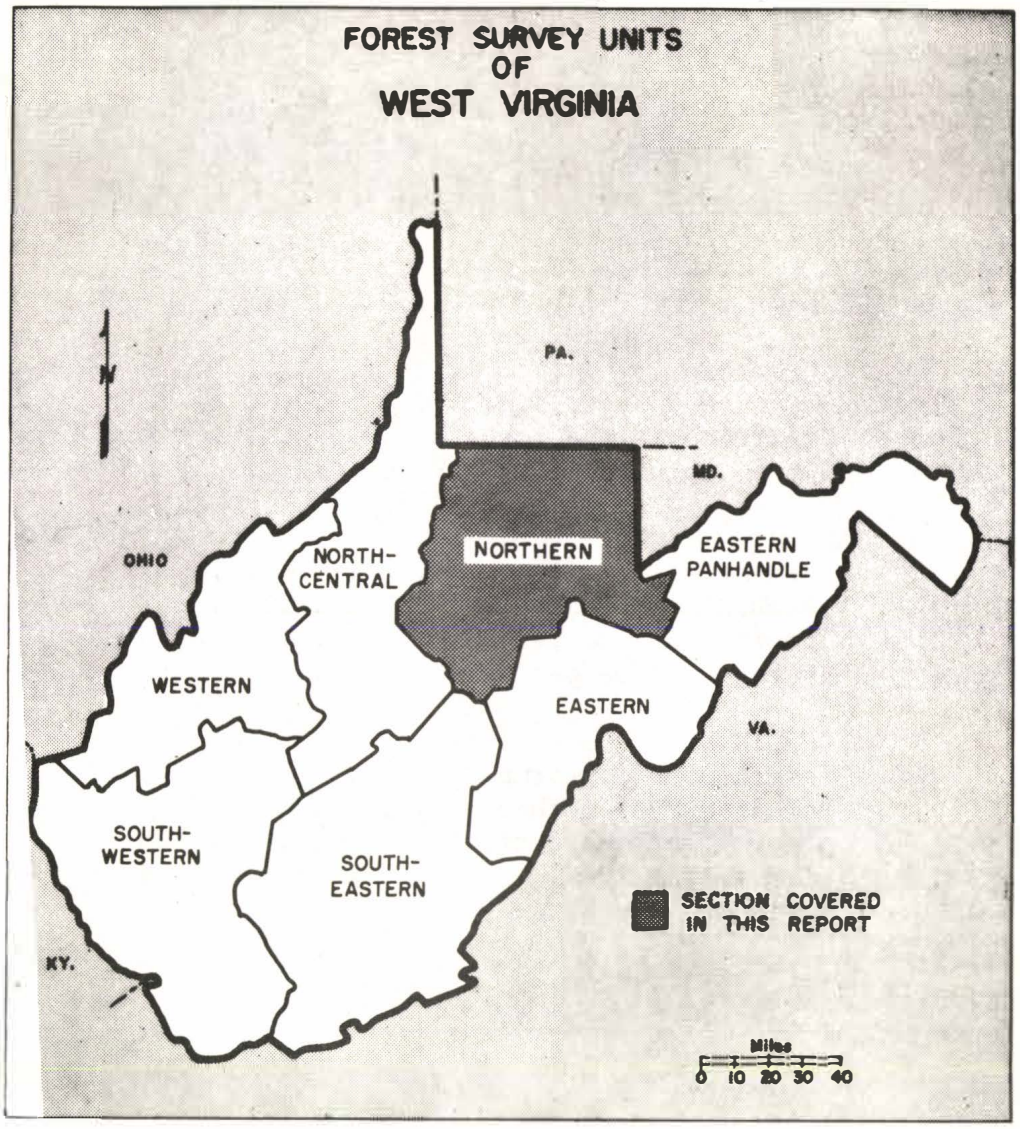
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FOREST STATISTICS

FOR THE

NORTHERN SECTION

OF WEST VIRGINIA

by

Robert D. Wray, *forest economist*

Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture

GENERAL

The Northern Section of West Virginia includes nine counties: Barbour, Harrison, Lewis, Marion, Monongalia, Preston, Taylor, Tucker, and Upshur.

The topography in this section is generally rolling except for mountainous areas in Tucker and Preston Counties. Mining, farming, and lumbering are the major industries.

The Forest Area

The total land area of these 9 counties is nearly 2.2 million acres. Forty-seven percent of the land is forested.

Commercial forest land amounts to 1,030,500 acres. In addition, 3,300 acres of forest land are reserved from com-

mercial cutting. Most of the reserved forest land is in State parks. All the counties but two--Preston and Tucker--are less than half forested.

Ownership

Private owners hold 90 percent of the commercial forest land. Farmers own 37 percent and other private owners 53 percent.

Most of the publicly owned commercial forest land is in the Monongahela National Forest. The State of West Virginia holds about 1 percent of the commercial forest, chiefly in Cooper's Rock State Forest.

The Forest Types

Oak types, chiefly red oak, occupy more than 40 percent of the forest land. The yellow-poplar type occupies one-third of the forest land and the sugar maple-beech-yellow birch type one-fifth. The remaining 4 percent is almost equally divided between minor hardwood types and softwood types.

Condition Of The Forests

More than half the saw-timber volume in the section is found on the 15 percent of the forest area that supports stands of at least 5,000 board feet per acre.

About one-fourth of the forest land has stands of 1,500 to 5,000 board feet per acre. The remaining 61 percent of the forest land contains only 14 percent of the saw-timber volume. Some of this (24 percent of the total) has little or no stocking of trees 5 inches and larger in diameter.

Timber Volume

The Northern Section of West Virginia contains more than 1.8 billion board feet of saw timber. Twenty-nine percent of this volume is red oak. Only 2 percent is softwood (hemlock and spruce). The rest is distributed among various other hardwoods, chiefly yellow-poplar, beech, hickory, white oak, sugar maple, and chestnut oak.

(Although all of the volume reported above meets the requirements for saw timber, some of it may not be operable from a strictly business viewpoint. Operability depends upon species, quality, volume-per-acre, accessibility, markets, and so on. These are the things that determine whether one can cut timber and make money. However, it is not within the scope of this statistical report to distinguish between

operable and inoperable timber stands. The purpose here is merely to report the total amount of timber that exists in this part of West Virginia. These statistics will be analyzed later in a comprehensive report for the entire State.)

The growing stock amounts to 688 million cubic feet. It is equally divided between saw timber and pole timber.

The total cubic volume is the equivalent of 8.6 million cords. Seventy percent of this volume is in trees of less than 15 inches' diameter.

NORTHERN SECTION OF WEST VIRGINIA

Table 1.--Land area and forest area, 1949

Class	Area	
	Acres	Percent
Forest land:[1]		
Commercial	1,030,500	47
Noncommercial	3,300	(2/)
Total forest land	1,033,800	47
Nonforest land[3]	1,147,300	53
All land[4]	2,181,100	100

[1]See Appendix for definitions.

[2]Less than 0.5 percent.

[3]Includes about 4,000 acres of water in areas less than 40 acres.

[4]From Areas of the United States 1950, Bureau of the Census.

NORTHERN SECTION OF WEST VIRGINIA

Table 2.--Land area and commercial forest area by county, 1949

County	Land	Commercial forest	
	Acres	Acres	Percent
Barbour	215,000	77,500	36
Harrison	267,500	62,000	23
Lewis	250,900	85,800	34
Marion	197,800	79,100	40
Monongalia	233,600	109,000	47
Preston	412,800	250,900	61
Taylor	108,800	41,000	38
Tucker	269,400	223,000	83
Upshur	225,300	102,200	45
Total	2,181,100	1,030,500	47

NORTHERN SECTION OF WEST VIRGINIA

Table 3.--Commercial forest area by ownership, 1949

Ownership	Area	
	Acres	Percent
Private:		
Farm forest land[1]	381,700	37
Other private	540,500	53
Total private	922,200	90
Public:		
National forest	94,700	9
Other Federal	300	(2/)
State[3]	13,300	1
Total public	108,300	10
All ownerships	1,030,500	100

[1]Census of Agriculture, 1950.

[2]Less than 0.5 percent.

[3]Chiefly in Cooper's Rock State Forest.

NORTHERN SECTION OF WEST VIRGINIA

Table 4.--Commercial forest area by forest type, 1949

Forest type	Area	
	Acres	Percent
Red oak	248,000	24
White oak	109,900	11
Chestnut oak	59,300	6
Yellow-poplar	359,100	34
Sugar maple-beech-yellow birch	214,100	21
Other hardwood types	22,400	2
Softwood types	17,700	2
All types	1,030,500	100

NORTHERN SECTION OF WEST VIRGINIA

Table 5.--Commercial forest area by stand-size class, 1949

Stand-size class	Area	
	Acres	Percent
Saw-timber stands:		
More than 5,000 bd.ft. per acre	149,800	15
1,500-5,000 bd.ft. per acre	251,200	24
Pole-timber stands:		
More than 600 cu.ft. per acre	173,800	17
200-600 cu.ft. per acre	207,500	20
Other stands	248,200	24
All stands	1,030,500	100

NORTHERN SECTION OF WEST VIRGINIA

Table 6.--Net volume of live timber on commercial forest land by species, 1949

Species	Growing stock		Saw timber[1]
	Thousand cu.ft.	Equivalent in cords[2]	Thousand bd.ft.
Red oak	122,700	1,533,800	530,600
Yellow-poplar	86,500	1,081,200	245,200
Beech	46,000	575,000	187,700
Hickory	50,900	636,200	141,600
White oak	49,100	613,800	128,800
Sugar maple	39,100	488,800	126,300
Chestnut oak	43,400	542,500	119,400
Black cherry	31,400	392,500	70,700
Yellow birch	31,600	395,000	58,200
Red maple	52,700	658,700	36,600
Basswood	17,700	221,200	30,800
Elm	15,400	192,500	21,900
Ash	16,100	201,300	19,500
Other hardwood	68,500	856,300	94,500
All hardwood	671,100	8,388,800	1,811,800
Hemlock	14,600	182,500	31,800
Spruce	2,800	35,000	6,700
All softwood	17,400	217,500	38,500
All species[3]	688,500	8,606,300	1,850,300

[1] International $\frac{1}{4}$-inch log rule.

[2] Rough standard cords. 1 cord = 80 cubic feet.

[3] In addition there are 80 million cubic feet (net volume) in live cull trees.

NORTHERN SECTION OF WEST VIRGINIA

Table 7.--Net volume of live timber on commercial forest land by diameter class, 1949

Diameter class[1] (inches at breast height)	Growing stock	Saw timber
	Thousand cu.ft.	Thousand bd.ft.
Hardwood:		
6	105,300	--
8	123,200	--
10	107,600	--
12	64,000	270,100
14	67,400	331,600
16	58,800	318,700
18	39,200	223,600
20	24,500	143,200
22	25,400	155,800
24	25,400	158,600
26	8,200	53,200
28	3,400	23,100
30	4,100	29,500
32	3,500	22,000
34 and larger	11,100	82,400
All hardwood	671,100	1,811,800
Softwood:		
6	2,500	--
8	6,000	--
10	2,500	9,500
12	1,800	7,500
14	900	3,800
16	600	2,900
18 and larger	3,100	14,800
All softwood	17,400	38,500
Softwood and hardwood	688,500	1,850,300

[1] The midpoint of each 2-inch diameter class is indicated.

Table 8.--Average net volume per acre of live timber on commercial forest land, by stand-size class, 1949

Stand-size class	Growing stock	Saw timber
	Cubic feet	Board feet
Saw-timber stands:		
More than 5,000 bd.ft. per acre	1,660	6,720
1,500-5,000 bd.ft. per acre	920	2,410
Pole-timber stands:		
More than 600 cu.ft. per acre	690	800
200-600 cu.ft. per acre	350	320
Other stands:	60	130
All stands[1]	670	1,800

[1]Hardwood constitutes 98 percent of the total board-foot volume, or 98 percent of the total cubic-foot volume.

APPENDIX

DEFINITIONS OF TERMS

Forest Area

Forest land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre and isolated strips of timber less than 120 feet wide are excluded.)

Commercial forest land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order, but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Forest Types

Forest types are defined according to the species, or species group, that make up the major portion of the stand in terms of board feet in saw-timber stands or number of stems in other stands.

The type names are self-explanatory. "Other hardwood types" include aspen-pin cherry and bottomland hardwoods. "Softwood types" include spruce-hardwood and hemlock.

Stand-Size Classes

Saw-timber stands.--Stands with saw-timber trees, having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$-inch rule.

Pole-timber stands.--Stands failing to meet the saw-timber stand specification, but at least 10 percent stocked

with pole-timber and larger trees (5.0 inches d.b.h. and larger), and with at least half of the minimum stocking in pole-timber trees. (Pole-timber stands carry at least 200 cubic feet per acre.)

Other stands.--Forest stands that do not qualify as saw-timber or pole-timber; stands of seedlings and saplings; nonstocked areas.

Tree Classes

Saw-timber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and which are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6 inches in diameter, inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8 inches in diameter, inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timber, or ties.)

Pole-timber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for saw-timber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make saw-timber trees eventually.)

Seedling and sapling trees.--Trees of commercial species less than 5.0 inches d.b.h.

Cull trees.--Live trees of saw-timber or pole-timber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

(This volume is also given in rough, standard cords, bark included. Cord volume is derived from cubic-foot volume by applying a factor of 80 cubic feet per cord.)

Live saw-timber volume.--Net volume in board feet, International $\frac{1}{4}$-inch rule, of live saw-timber trees.

FOREST SURVEY METHODS

These forest statistics for the Northern Section of West Virginia are based on information gathered from sample plots. These plots are distributed randomly over the entire area.

They were first located on aerial photographs. Trained photo interpreters then examined the photos and classified each forest plot according to stand size. Field crews inspected enough plots on the ground to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots.

The survey was designed for maximum accuracy in the estimate of total merchantable cubic volume.

ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error.

First, photo interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. Fortunately the size of this error can be measured. In the Northern Section the chances are 2 to 1 that the error will not exceed 2.5 percent of the total forest area, 7.9 percent of the total board-foot volume, or 5.2 percent of the total cubic-foot volume.

In each of the tables, the total figures are more reliable than the subtotals. The subtotals are more reliable than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

SPECIES TALLIED

The various commercial tree species tallied in the Northern Section are listed below.[1] Approved common names are shown in parentheses if these differ from the brief name used in the tables. Approved scientific names are underlined.

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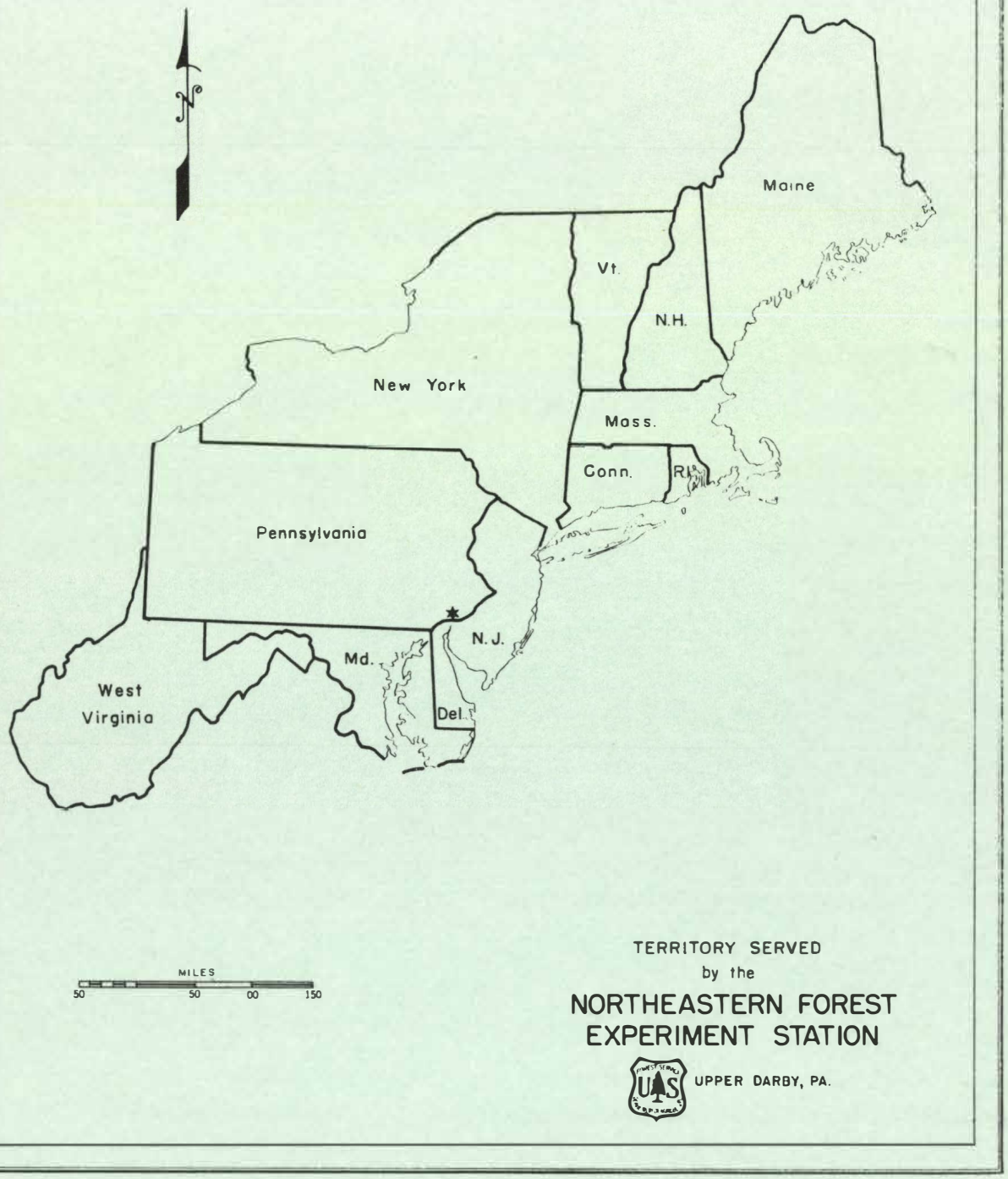
[1] U S FOREST SERVICE. CHECK LIST OF THE NATIVE AND NATURALIZED TREES OF THE UNITED STATES INCLUDING ALASKA. 325 PP. WASHINGTON. 1949.

Hardwoods

Red oak (Northern red oak)	- Quercus borealis
(Black oak)	- Quercus velutina
(Scarlet oak)	- Quercus coccinea
Yellow-poplar	- Liriodendron tulipifera
Beech (American beech)	- Fagus grandifolia
Hickory	- Carya species
White oak	- Quercus alba
Sugar maple	- Acer saccharophorum
Chestnut oak	- Quercus montana
Black cherry	- Prunus serotina
Yellow birch (Yellow birch)	- Betula lutea
(Sweet birch)	- Betula lenta
Red maple	- Acer rubrum
Basswood (American basswood)	- Tilia americana
Elm	- Ulmus species
Ash	- Fraxinus species
Other hardwoods	
(Yellow buckeye)	- Aesculus octandra
(Ohio buckeye)	- Aesculus glabra
(Blackgum)	- Nyssa sylvatica
(Black walnut)	- Juglans nigra
(Butternut)	- Juglans cinerea
(Black locust)	- Robinia pseudoacacia
(Bigtooth aspen)	- Populus grandidentata
(Quaking aspen)	- Populus tremuloides
(Honeylocust)	- Gleditsia triachanthos
(Cucumbertree)	- Magnolia acuminata

Softwoods

Hemlock (Eastern hemlock)	- Tsuga canadensis
Spruce (Red spruce)	- Picea rubens



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